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## Caribbean Basin Biotechnology Annual 2005

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**Report Highlights:**

In the Caribbean Basin, there is no commercial production of crops using biotechnology.

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Includes PSD Changes: No  
Includes Trade Matrix: No  
Unscheduled Report  
Miami [C11]  
[C1]

## SECTION I. EXECUTIVE SUMMARY

The United States has substantial and growing agricultural trade interests in the Caribbean region. With a small amount of arable land, high input costs, and no economies of scales, the majority of the Caribbean islands are very dependent on U.S. food imports. In general, the regulatory environments of the Caribbean islands are fairly open to all types of U.S. products.

The Caribbean, in general, is very open to biotechnology. However, the geo-political fragmentation of the Caribbean poses a great challenge for developing a regional biotechnology policy. While the Caribbean is made up of 23 island states, each state government has the responsibility for policies and regulations in their own islands. To date, more than half of the islands are using biotechnology in agricultural production. Yet, there is little commercialization of biotechnology in the region outside tissue culture and the micropropagation of plants. Biotech centers and universities with biotech programs are found in the most influential islands: Barbados, Trinidad, and Grenada. University professors and scientists are eager to move biotechnology research forward and generate positive biotechnology policy initiatives.

## SECTION II. BIOTECHNOLOGY PRODUCTION AND TRADE

The region retains a positive attitude towards biotechnology. Since 1965, the Caribbean Agriculture Research and Development Institute (CARDI) has led the region's development of agricultural biotechnology. Based in Trinidad and Tobago, CARDI provides the Member States of the Caribbean Community and Common Market (CARICOM) with agricultural biotechnology research and development assistance. Most of the regional biotechnology activities are carried out in collaboration with Ministry of Agriculture, Caribbean Development Bank (CDB), Food and Agriculture Organization of the United Nations (FAO), United Nations Educational Scientific and Cultural Organization (UNESCO), United Nations Development Programme (UNDP), Centro Internacional de Agricultura Tropical (CIAT), Institut National de la Recherche Agronomique (INRA), and International Institute of Tropical Agriculture (IITA).

Biotechnology in the Caribbean islands has generally been limited to the fermentation of rum and beer. However, recent developments have been made across the region with respect to the use of low-tech tissue culture production systems for the micropropagation of several food and ornamental plants. This *in vitro* propagation system has made significant contributions to the progress of the region's agricultural production. Additionally, the region has been active in researching and developing methods for the preservation of food products and increasing the shelf-life of plant products. Most recently, the technique of embryo recovery and transfer (ET) has been used in the region to enhance the production of meat and milk products. In 2005, CARICOM announced its support for the commercialization of biotechnology in the Caribbean region.

Source: Island Communities and Biotechnology Edgar DaSilva and Mary Taylor (1998)

The following table highlights the most notable biotechnology activities in the Caribbean islands\*:

|         |  |
|---------|--|
| Bahamas | The Ministry of Agriculture supports the development of tissue culture facilities to aid in the bulk production of citrus fruits and root crops. |
|---------|--|

|                                |  |
|--------------------------------|--|
| Barbados                       | Since 1979, tissue culture programs have been in place to improve the yam species <i>Discorea alata</i> . More than 1 million kilograms of planted materials are distributed to farmers in 11 CARICOM countries, contributing to a 40 percent increase in crop yield.<br>There have also been recent developments with respect to vesicular-arbuscular mycorrhizae (VAM) inoculants for use with red kidney beans, Winged beans, and moth beans. |
| Dominica                       | In an effort to contain and eliminate the outbreak of the Leaf Burning Disease, tissue culture biocontrol actions have been developed.   |
| Grenada                        | In 1992, a tissue culture facility opened at Mt. Whaldeal, St. George. The research at this facility is directed towards controlling and containing the spread of the <i>Moko</i> disease. Approximately 4,000 plantlets are produced per month and circulated to banana farms within the region.  |
| St. Kitts and Nevis            | The Ministry of Agriculture supports non-sugar agriculture development programs and basic tissue culture production of tuber crops.  |
| St. Vincent and the Grenadines | The Chinese Technical Mission has introduced yam tissue cultures.  |
| Trinidad and Tobago            | The Department of Plant Science at the University of the West Indies focuses on the development of protocols in overseeing the health and quality of plant germplasm, and managing appropriate biocontrol and quarantine measures that are targeted at improving crop yields of yams, sweet potatoes, cassava, and plantain species.   |

Source: Island Communities and Biotechnology Edgar DaSilva and Mary Taylor (1998)\*

It is important to note that there is no information available on genetically modified (GM) food imports in the Caribbean region.

### SECTION III. BIOTECHNOLOGY POLICY

#### Regulatory Framework

No comprehensive legal or regulatory frameworks have been implemented in any of the CARICOM countries that specifically address the major issues relevant to biotechnology. For the most part, existing legal and administrative mechanisms within the region are not adequately designed to address modern biotechnology issues (i.e. research and development, trade, biosafety, food safety, or labeling). However, in 2003, CARICOM Ministers mandated the Caribbean Agricultural Research and Development Institute (CARDI) to develop a regional policy on biosafety. Furthermore, recent developments have been made in many of the islands within the region concerning biosafety. In 2000, Barbados established a National Biosafety/Biotechnology Committee. In 2003, the National Biosafety Advisory Council (NBAC) was developed in Grenada to assume administrative functions in relation to issues outlined in the Cartagena Protocol on Biosafety, and Grenada has recently developed legal apparatus relevant to genetically modified food imports.

#### Political Factors Influencing Regulatory Decisions Related to Agricultural Biotechnology

The European Union (EU) has put considerable resources in the Caribbean to gain support for their stance on biotechnology. Europe imports more agricultural products from the Caribbean region than that of the United States, enhancing their influence on the region. While modest U.S. Government funding and activities have been directed towards supporting the views of the United States on biotechnology, the Food and Agricultural Organization of the United Nations (FAO) has made a positive impact of the region countering the views of the EU.

### **Approved Biotechnology Crops**

Due to the lack of regulatory frameworks concerning modern biotechnology, there are no biotechnology crops currently approved for direct consumption, processing, or animal feed. Furthermore, there is no information currently available on the field testing of biotechnology crops in the area, or the region's policy on coexistence between biotechnology and non-biotechnology crops.

### **Biosafety Protocol and Trade Barriers**

Most of countries within the Caribbean have signed the Cartagena Protocol on Biosafety, and as of August 30, 2005, instruments of ratification or accession to the Convention on Biological Diversity have been deposited with the UN Secretary-General from the following Parties: Antigua and Barbuda, Bahamas, Barbados, Cuba, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Trinidad and Tobago. Provisions will have to be made by each island government to include requirements for biosafety management under the Cartagena Protocol. This may ultimately affect the trade in products that contain genetically modified organisms (GMOs) since the issues of identification and labeling of food products are part of the agreement.

## **SECTION IV. MARKETING ISSUES**

A small consumer viewpoint survey was conducted in Barbados, Jamaica, and Grenada to ascertain consumer viewpoints with respect to biotechnology and GM food products. According to the survey results, GM foods were not among the top five foods avoided by consumers. Furthermore, while consumers indicated that it was important to see food labels indicating that there is GM content in the food products or derived from a GM source, consumers indicated that the labeling of expiry dates and nutritional content were more important. For more on information on this study, please refer to Section 5 of *Biotechnology Development Applications and Trade: Caribbean Perspective*.

## **SECTION V. REFERENCE MATERIAL**

DaSilva, Edgar J. and Mary Taylor. (1998). Island Communities and Biotechnology. In: Policies of International Cooperation, Eds. DaSilva, E.J. et al. Vol. 1. No. 1, Issue of April 15, 1998.

Caribbean Policy Development Center. Biotechnology Development Applications and Trade: Caribbean Perspective. June 23, 2003.  
[http://www.cpdngo.org/article.php3?id\\_article=43](http://www.cpdngo.org/article.php3?id_article=43).

## **APPENDIX A.**

**TABLE OF APPROVED BIOTECHNOLOGY PRODUCTS (The following is a partial list of deregulated products in the United States.)**

| Crop   | Trait Category                             | Applicant(s)                    | Event(s) | Trait Description(s)   | Reviewed Uses within the U.S. |
|--|--|---------------------------------|----------|--|-------------------------------|
| Corn, Field Corn / Zea mays                        | Insect Resistance, Herbicide Tolerance     | Aventis CropScience, AgrEvo     | CBH-351  | 1) Lepidopteran resistant; Cry9C; from <i>Bacillus thuringiensis</i> (Bt) 2) Glufosinate tolerant; Phosphinothricin acetyl transferase (PAT); from <i>Streptomyces hygroscopicus</i> | Feed                          |
| Canola / Brassica napus, Brassica napus var. napus | Herbicide Tolerance                        | Aventis CropScience             | HCN92    | Glufosinate tolerant; Phosphinothricin acetyl transferase (PAT); from <i>Streptomyces viridochromogenes</i>  | Food and feed                 |
| Canola / Brassica napus, Brassica napus var. napus | Phytate degradation                        | BASF                            | MPS961   | Phytate degradation; Phytase; from <i>Aspergillus niger</i>  | Food and feed                 |
| Cantaloupe / Cucumis melo                          | Delayed Fruit Ripening                     | AgriTope Inc.                   | A        | Delayed fruit ripening; S-adenosylmethionine hydrolase; from <i>E. coli</i>  | Food and feed                 |
| Canola / Brassica napus, Brassica napus var. napus | Herbicide Tolerance                        | Rhône Poulenc Inc.              | OXY-235  | Bromoxynil tolerant; Nitrilase; from <i>Klebsiella ozaenae</i>   | Food and feed                 |
| Corn / Zea mays                                    | Insect Resistance, Lepidopteran Resistance | Ciba-Geigy Corporation, Mycogen | 176      | Lepidopteran resistant; Cry1Ab; from <i>Bacillus thuringiensis</i> (Bt)  | Food and feed                 |
| Tomato / Lycopersicon esculentum                   | Insect Resistance, Lepidopteran Resistance | Monsanto Company, Calgene Inc.  | 5345     | Lepidopteran resistant; CryIAC; from <i>Bacillus thuringiensis</i> (Bt)  | Food and feed                 |
| Corn / Zea mays                                    | Insect Resistance, Lepidopteran Resistance | Monsanto Company                | MON809   | Lepidopteran resistant; Cry1Ab; from <i>Bacillus thuringiensis</i> (Bt)  | Food and feed                 |

Note: The information in appendix A comes from the USG biotech database  
[http://usbiotechreg.nbii.gov/database\\_pub.asp](http://usbiotechreg.nbii.gov/database_pub.asp)